

### **Acoustic properties of juvenile anchovy (*Engraulis encrasicolus*) in the Bay of Biscay**

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Since 2006 the Spanish Institute of Oceanography performs an autumn survey targeting juvenile anchovy (*Engraulis encrasicolus*) in the Bay of Biscay. Data from a Simrad EK60 with five frequencies (18, 38, 70, 120, and 200 kHz) from the 2009 survey is employed for a multifrequency analysis of the anchovy backscattering. Differences with sizes and depth are evaluated. Four simple backscattering models accounting for depth, tilt angle, swimbladder and body physiology are developed, and compared with observed values by means of an unsupervised neural network, the Self-Organizing Map. A revision of the inversion method is considered for the inference of anchovy sizes; several metrics and optimizers are compared and discussed. Techniques to facilitate convergence and frequency weighting are explored.